

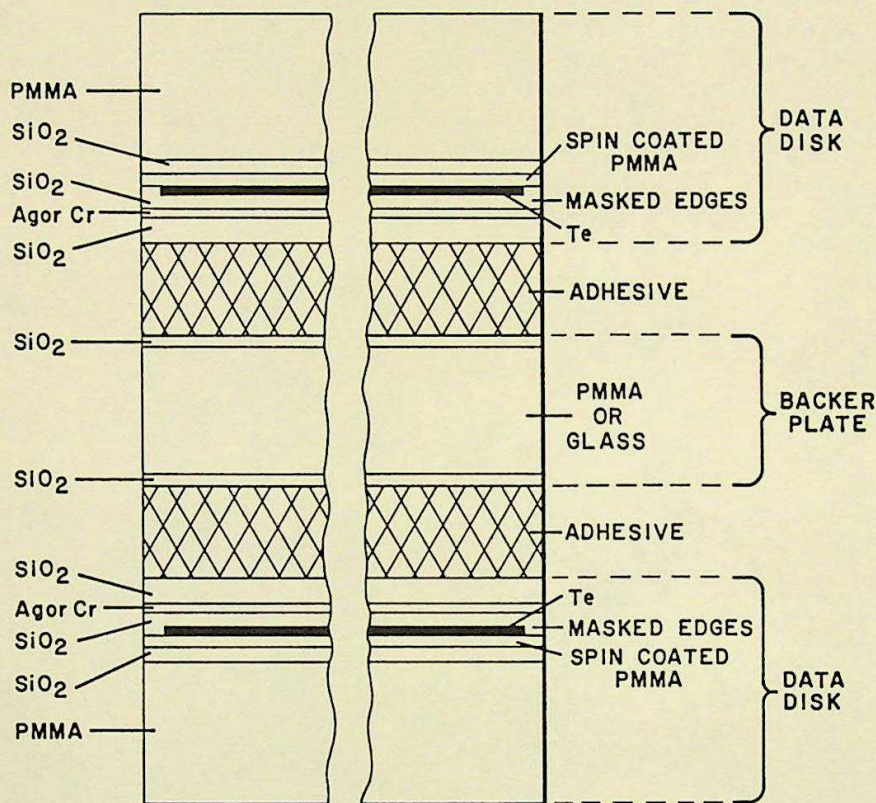
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INEXPENSIVE OPTICAL RECORDING MEDIA WITH HERMETIC SEAL AND HIGH SENSITIVITY

Roberta M. Fay
Richard D. Weir
Philip L. Chen

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Two problems exist with prior art optical disks: (a) oxidation of the media and (b) disk radial runout. Thin films of SiO₂ and Al₂O₃ deposited over tellurium (Te), the writing medium, will eliminate both problems.

The Te coated optical disk should be optimized in terms of (a) recording sensitivity, (b) long term stability, (c) cost reduction. To improve recording sensitivity, a spin coated PMMA layer may be placed immediately below the Te. A 1/4 wavelength of SiO₂ is coated over the Te followed by a flash of a highly reflective metal such as Al, Ag or Cr.

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INEXPENSIVE OPTICAL RECORDING MEDIA WITH HERMETIC SEAL AND HIGH SENSITIVITY (Cont'd)

To enhance long term stability, both an undercoat and overcoat of SiO_2 can be used. If the disk edges are masked during the Te deposition, then the disk edges will not have any Te and the subsequent SiO_2 overcoating will seal the sides as well as the top of the Te thin film.

To minimize cost, plastic substrates can be used instead of glass unless the chemically strengthened Corning fusion drawn glass provides an economically viable alternative. After the spin coating operation, all subsequent thin film coatings can be done inside one vacuum system under one pumpdown. To prevent substrate overheating and stress development, some temperature controlling mechanism should be used. In an evaporation system, the substrate should be mechanically attached to a heat sink. A sputtering system will automatically result in a certain amount of temperature control since the substrate is bonded to a support plate that in turn is water cooled.

Ideally, the PMMA spin coating should not reach the edges so that the spin coating itself can be sealed off with SiO_2 .